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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/649,632	08/28/2003	Hideo Ukuda	03500.017519	5553

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EXAMINER

CHANG, AUDREY Y

ART UNIT	PAPER NUMBER
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2872

DATE MAILED: 06/23/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/649,632

Applicant(s)

UKUDA, HIDEO

Examiner

Audrey Y. Chang

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-21 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-21 is/are rejected.
- 7) ☐ Claim(s) ____ is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on ____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. ____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- ☒ Notice of References Cited (PTO-892)
- ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date 10/03, 2/04, 6/04.
- ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. ____.
- ☐ Notice of Informal Patent Application (PTO-152)
- ☐ Other: ____.

DETAILED ACTION

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

2. **Claims 1-4 and 6-7 are rejected under 35 U.S.C. 102(e) as being anticipated by patent issued to Ukuda (PN. 6,759,471).**

The applied reference has a common assignee with the instant application. Based upon the earlier effective U.S. filing date of the reference, it constitutes prior art under 35 U.S.C. 102(e). This rejection under 35 U.S.C. 102(e) might be overcome either by a showing under 37 CFR 1.132 that any invention disclosed but not claimed in the reference was derived from the inventor of this application and is thus not the invention “by another,” or by an appropriate showing under 37 CFR 1.131.

Ukuda teaches an *optical material* that is comprised of fine *inorganic particles* dispersed in *polymer* such as TiO₂ particles dispersed in PVA polymer or ITO particles in PMMA polymer that has refractive index *greater than* $6.667 \times 10^{-3} V_d + 1.70$, (please see Figure 11 and comparative example 2 and Figure 12, comparative examples 4 and 5), and Abbe number (V_d) less than 16, (please see Figures 11 and 12 and Table 3 and 4, columns 13-17). With regard to claim 4, Ukuda teaches that the particles have size ranges between 2 nm to 100 nm, (please see column 3, lines 12-14).

Ukuda teaches that the optical material can be used in optical application such as diffraction grating, (please see column 1), although it does not teach explicitly that it is formed by curing reaction, but the *method* of making the optical element is not given any patentable weight per se for it does not distinguish the final product from the prior art. (Please see MPEP 2173.(05)).

This reference has therefore anticipated the claims.

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claims 1-2, 6-9, 13-16 and 20-21 are rejected under 35 U.S.C. 103(a) as being unpatentable over the patent issued to Imamura et al (PN. 5,847,877) in view of the patent issued to Nakamura et al (PN. 6,778,240).

Imamura et al teaches a *diffraction optical element* that is comprised of a *first diffractive optical element* or a *first layer*, (11, Figures 11-13) and a *second diffractive optical element* or a *second layer* (12) that each has a *diffraction surface* (21) wherein the diffraction surfaces are *opposing* to each other. Imamura et al teaches that the first diffractive element or the first layer is comprised of an *optical material* that has *low refractive index* and *high dispersion* and the second diffractive element or the second layer is comprised of an optical material that has *high refractive index* and *low dispersion*, (please see the Abstract and columns 2 and 8). Imamura et al further teaches that the diffractive element having low refractive index and high dispersion is comprised of optical material formed by dispersing TiO_2 in silica glass and as shown in Figure 16, the refractive index of the optical material is well greater than $6.667 \times 10^{-3} V_d + 1.70$ for the Abbe number (V_d) less than 20. Although this reference does not teach explicitly that the optical material has Abbe number that is less than 16, however as shown in the Figure 16, it is implicitly true that by varying the percentage of the TiO_2 namely by increasing the concentration one skilled in the art can obtain the optical material having an Abbe number less than 16 and have a

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refractive index (n) that satisfies the equation $n > 6.667 \times 10^{-3} V_d + 1.70$ for the benefit of providing optical material that has desirable high dispersion property that can be applied in optical applications that require low refractive index yet high dispersion property and also to make the diffraction grating of Imamura et al to have desired diffraction efficiency that is more independent of the wavelength.

With regard to claims 6-7, Imamura et al does not teach explicitly that the diffraction grating is formed by curing process however the method of making the diffraction grating is not given any patentable weight per se for it does not distinguish the final product from the prior art, (please see MPEP 2173.05).

With regard to claims 13-14 and 20-21, Imamura et al teaches the diffraction grating is a laminated diffraction grating that can be applied in imaging optical systems, (please see column 1).

5. Claims 3-5, 10-12, and 17-19 are rejected under 35 U.S.C. 103(a) as being unpatentable over the patent issued to Imamura et al (PN. 5,847,877) as applied to claims 1, 8 and 15 above, and further in view of the patent issued to Nakamura et al (PN. 6,778,240).

The diffraction optical element taught by Imamura et al as described for claims 1, 8 and 15 above has met all the limitations of the claims. Imamura et al teaches that the optical diffractive element made of optical material having low refractive index and high dispersion can be formed by dispersing *titanium oxide particles* in silica glass but it does not teach explicitly that it may also be formed by dispersing titanium oxide particles in polymer with particle size in the range between 2-100 nm. Nakamura et al in the same field of endeavor teaches forming optical layer material having refractive index between 1.57 and 2.00 by dispersing *titanium oxide* in *polymer* with the particles size being less than 100 nm, (please see column 10, lines 23-43). It would then have been obvious to one skilled in the art to make the optical material having low refractive index (in the range of 1.6 to 1.8 as shown in Figure 16 of Imamura et al) and high dispersion property to also be made by dispersing titanium particles with

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particle size of less than 100 nm in polymer for the benefit of making the material with other commercial available polymer materials to perhaps cut the cost and also to make the particles with such size to achieve the good scattering or dispersion properties.

Although this reference does not teach explicitly to use the cited polymer however the cited PVC material is a very common kind of polymer material for making optical element such modification would have been obvious to one skilled in the art for the benefit of using suitable material for meeting the particular needs.

Double Patenting

6. The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. See *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and, *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent is shown to be commonly owned with this application. See 37 CFR 1.130(b).

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

7. Claims 1, 6-8, 13-15, 17-18 and 20-21 are rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 1, 8-9, and 14-16 of U.S. Patent No. 6,912,092 (US 2004/0051949 A1). Although the conflicting claims are not identical, they are not patentably distinct from each other because they both claim an optical material and a diffractive optical element comprising such material wherein the material has a refractive index satisfies the same equation and has an Abbe number less than 22.7.

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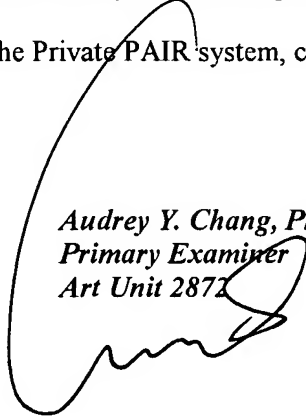
Contact Information

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Audrey Y. Chang whose telephone number is 571-272-2309. The examiner can normally be reached on Monday-Friday (8:00-4:30), alternative Mondays off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Drew Dunn can be reached on 571-272-2312. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

*Audrey Y. Chang, Ph.D.
Primary Examiner
Art Unit 2872*



A. Chang, Ph.D.